

The Prairie Astronomer

May 2017 Volume 58, Issue #5



Photo by Larry Stepp



Night Sky Network



The Newsletter of the Prairie Astronomy Club

The Prairie Astronomer

NEXT PAC MEETING: May 30, 6:30pm

Club Dinner at Dino's

PROGRAM

Club Dinner at Dino's Eastside Grille, 2901 S 84th, 6:30pm.

Tentative Program: Solar Eclipse Photography

CONTENTS

- 5 Observatory Update
- 8 Jupiter
- 9 HST
- 10 NSP
- 11 June Observing
- 12 Coma Berenices
- 13 Titan's Seas
- 15 From the Archives
- 19 Club Information

FUTURE PROGRAMS

June: Solar Star Party - and eclipse prep for public

July: NSP - no club meeting

August: NSP & Eclipse review

October: Club viewing night at Hyde

November: How to Buy a Telescope



Buy the book! The Prairie Astronomy Club: Fifty Years of Amateur Astronomy.

Order online from [Amazon](https://www.amazon.com) or [lulu.com](https://www.lulu.com).

EVENTS



PAC Meeting
 Tuesday May 30, 2017, 6:30pm
 Club Dinner - to be announced

MSRAL June 9-11
 Missouri State University, Springfield, MO.

PAC Meeting
 Tuesday June 27, 2017, TBA
 Hyde Observatory

Nebraska Star Party, July 23-28

July PAC Meeting canceled due to overlap with NSP

2017 STAR PARTY DATES



Photo by Brian Sivill

	Star Party Date	Star Party Date	Lunar Party Date
January	Jan 20th	Jan 27th	
February	Jan 17th	Feb 24th	
March	Mar 17th	Mar 24th	
April	Apr 21st	Apr 28th	
May	May 19th	May 26th	May 5th
June	Jun 16th	Jun 23rd	Jun 30th
July	Jul 14th	Jul 21st	
NSP	July 23rd - July 28th		
August	Aug 18th	Aug 25th	
September	Sep 15th	Sep 22nd	Sep 1st
October	Oct 13th	Oct 20th	
November	Nov 10th	Nov 17th	
December	Dec 15th	Dec 22nd	

Dates in **BOLD** are closest to the New Moon.



PAC E-MAIL:

info@prairieastronomyclub.org

PAC-LIST:

Subscribe through [GoogleGroups](#).
 To post messages to the list, send to the address:

pac-list@googlegroups.com

ADDRESS

The Prairie Astronomer
 c/o The Prairie Astronomy Club, Inc.
 P.O. Box 5585
 Lincoln, NE 68505-0585

WEBSITES

- www.prairieastronomyclub.org
- <https://nightsky.jpl.nasa.gov>
- www.hydeobservatory.info
- www.nebraskastarparty.org
- www.OmahaAstro.com
- Panhandleastronomyclub.com
- www.universetoday.com/
- www.planetary.org/home/
- <http://www.darksky.org/>



Night Sky Network

Meeting Minutes

Minutes PAC Business Meeting
4/25/2017

President Jim Kvasnicka called the meeting to order at 7:31 p.m.

Announced coming events:

National Astronomy Day is April 29 this year, but University of Nebraska planetarium is not participating, so there will be no PAC involvement.

The next club meeting will be the annual dinner at Dino's on 84th street, May 30.

MSRAL, Midstates Region of the Astronomy League convention will be at Missouri State University, Springfield, June 9-11.

Nebraska Star Party is July 23-28 at Merritt Reservoir south of Valentine.

Great American Eclipse on August 21. Jim reported that when he helped with a Boy Scout event at Homestead Monument on Saturday night, April 22, the rangers were extremely excited about the upcoming eclipse.

Club star parties scheduled for the observing site south of Cortland are: May 19 and 26th.

Jim gave his Observing Report for May, including the fact that there are presently four binocular comets visible: Comet C2015 ER61 PANSTARRS morning comet in Aquarius; C2017-E4 (Lovejoy) morning

comet in Triangulum; 41P Tuttle-Giacobini-Kresak comet in Hercules; and C2015-V2 (Johnson) also in Hercules.

Decision for starting time of the May 30 club dinner at Dino's: 6:30 p.m. The Hyde Board will either not meet, or will meet after the dinner (to be decided at the dinner.)

Meeting adjourned at 7:42 p.m.

Program: Space Launch System (SLS) by Alexandra Dominguez, via Skype.

Lincoln Nebraska Solar Eclipse Trailer Now Online

The long-awaited eclipse trailer is now on YouTube. The video was written and produced by Lee Thomas, with historical research by Rick Brown. The URL is:

<https://youtu.be/HI5ISo8Jpsq> or search YouTube for "hyde observatory eclipse."



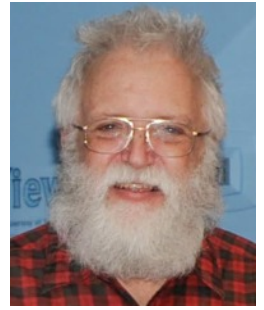
Observatory Update: A Couple of Galaxies with Many Friends_____

Rick Johnson

While I'd taken some of the spiral galaxies that hover around the edges of the Coma Cluster of galaxies, ABELL 1656, I'd not taken the center of it which is mostly S0 and elliptical galaxies. My field of view isn't sufficient to begin to cover the cluster. NED lists it as having a diameter of 5.33 degrees. I'd need over 100 images to cover it all. Fortunately, it is highly concentrated so I get a lot of its members by taking the center. NED lists it as having 484 members which is a severe understatement as there are

over 1000 galaxies in my image alone with redshift data. Far too many for me to even think about annotating. I settled on just listing those in the IC and NGC catalogs plus a couple PGC galaxies about as big and bright as the NGC and IC galaxies. The cluster has two main cD type galaxies that are huge and thus anchor gravitationally the cluster's vast members. The normal sized galaxies look like moths swarming around two lights being small in comparison to these two monsters. The cluster is listed with a redshift

that puts it 330 million light-years distant. At first, I wasn't going to include distance figures for these since they all are about this distance. But due to their orbiting the barycenter of the cluster which is rather massive they can have rather high velocities toward or away from us. Also listed in parenthesis are the non-redshift



distances which usually stick much closer to the 330 million light-year distance than does the redshift values. Comparing the two seemed interesting so I decided to include these distance estimates.

For some reason, I seem to have centered on the western one NGC 4874 so I'll start this huge text file there. NED lists 71 different catalog entries for it. SIMBAD adds a few more. SIMBAD also lists 1850 reference paper on it. Needless to say, I didn't begin to check them out as I would normally do. NGC 4874 is a huge, very diffuse galaxy. This makes determining its size difficult as it has no obvious edge to key on. Also, the halos around all the galaxies hovering about it adds to this confusion. Best I can say is it is at least 250" of arc across which gives it a diameter of some 400,000 light-years. Now that's big. It has no sign of dust nor gas, just old stars, and a jet of plasma, seen by radio telescopes, that extends some 1700 light-years from the core indicating it has an active supermassive black hole at its core. Hubble shows it is surrounded by many globular clusters as well as globular cluster sized galaxy cores. Apparently, only these cores remain after losing the rest of their stars to the massive galaxy. These are too faint for me to pickup. The galaxy was discovered by William Herschel on April 11, 1785. I was surprised that it isn't in either H400 observing program.

Above and a bit right of NGC 4874 is an odd wedge-shaped, diffuse object pointing to the

right. Is it a piece of IFN much brighter than the hits I see elsewhere in the image or stars. I didn't find anything on it. If anyone does please let me know. Also, as shown on the annotated image NGC 4874 carries a Di classification while 4887/9 a Dd classification. A lone D stands for Diffuse in an obscure classification system devised by William Morgan. But that had no further subdivision that I can find. He's the one that came up with cD for big diffuse galaxies that anchor galaxy clusters. That's the only piece of his system that is still used. So I asked NED what Dd and Di meant. They replied they couldn't find out either saying; "I have to claim that they have been "lost in the ether"." They did then say "BTW, we have changed our procedures such that this type of data tracking will not lose anything again." That indicates there are likely similar problems at the site of this at NASA's site. If any history buff knows about these designations please let me know and I'll pass it on to NED (NASA/IPAC Extragalactic Database).

The other anchoring galaxy is NGC 4884/89. Like NGC 4874 is it so diffuse determining its size is extremely difficult. I get a size of about 3 minutes of arc so it isn't as large. That translates to 300,000 light-years. But both galaxies have a very large halo encompassing both. It extends some 17 minutes of arc in my FITS stack. That would make the two some 1.6 million light-years across. There is some IFN in the background as well making this measurement somewhat iffy. It carries two NGC numbers. William

Herschel found it on the same night as NGC 4874 and got the position right. Then 80 years later, April 22, 1865, Heinrich d'Arrest found it but apparently gave slightly wrong coordinates. This caused Dreyer to enter it again as NGC 4884 when compiling his catalog that became the NGC. Most use the NGC 4889 designation. It isn't in either H400 program either.

As there are so many IC and NGC galaxies I'm just going to list their discovery info. A few warrant a bit more detail. I'm taking them right to left across the image.

IC 3943 Discovered by Hermann Kobold on May 28, 1895

IC 3946 Discovered by Hermann Kobold on May 12, 1896

IC 3949 NED says it is SA0 while Seligman says Sb? I prefer Seligman. Found by Kobold also on May 12, 1896. NGC 4858 Discovered by Heinrich d'Arrest on April 21, 1865. Not likely a cluster member

NGC 4860 Discovered by Heinrich d'Arrest on April 21, 1865

IC 3955 Discovered by Hermann Kobold on April 22, 1895

IC 3960 Discovered by Hermann Kobold May 12, 1896
NGC 4864 Discovered by John Herschel April 13, 1831

NGC 4867 Discovered by Heinrich d'Arrest on May 10, 1863

NGC 4869 Discovered by William Herschel on April 11, 1785

NGC 4871 Discovered by Heinrich d'Arrest on May 10, 1863

IC 3976 Discovered by Hermann Kobold on May 13, 1896

IC 3973 Discovered by Hermann Kobold on May 20, 1895. Either 3973 or 3976 is out of RA order.

NGC 4873 Discovered by Heinrich d'Arrest on May 10, 1863

NGC 4872 Discovered by Heinrich d'Arrest date unknown. It or 4873 is out of RA order.

NGC 4875 and NGC 4876 Discovered by Guillaume Bigourdan on May 16, 1885

IC 3998 Discovered by Hermann Kobold on April 22, 1895

NGC 4883 Discovered by Heinrich d'Arrest on April 22, 1865

NGC 4882/4886 Discovered by Heinrich d'Arrest on April 22, 1865 and April 6, 1864 respectively. I assume he got one of the positions wrong leading to two entries. He

wasn't very good with his coordinates.

IC 4011 Discovered by Hermann Kobold on April 22, 1895

IC 4012 Discovered by Hermann Kobold on May 11, 1896

IC 4021 Discovered by Hermann Kobold on May 11, 1896

NGC 4894 Discovered by John Herschel on March 30, 1827

NGC 4898 Discovered by Heinrich d'Arrest on April 6, 1864. A pair of galaxies, PGC 3098454 to the north and PGC 44736 to the south

IC 4026 Discovered by Hermann Kobold on May 11, 1896

IC 4030 Discovered by Hermann Kobold on May 9, 1896

IC 4033 Discovered by Hermann Kobold on May 9, 1896

IC 4040 Discovered by Guillaume Bigourdan on April 12, 1891, Seligman classifies it as Sbc? Pec

NGC 4906 Discovered by Heinrich d'Arrest on April 6, 1864

IC 4041 Discovered by Hermann Kobold on May 8, 1896

IC 4042 Discovered by Hermann Kobold on May 9, 1896

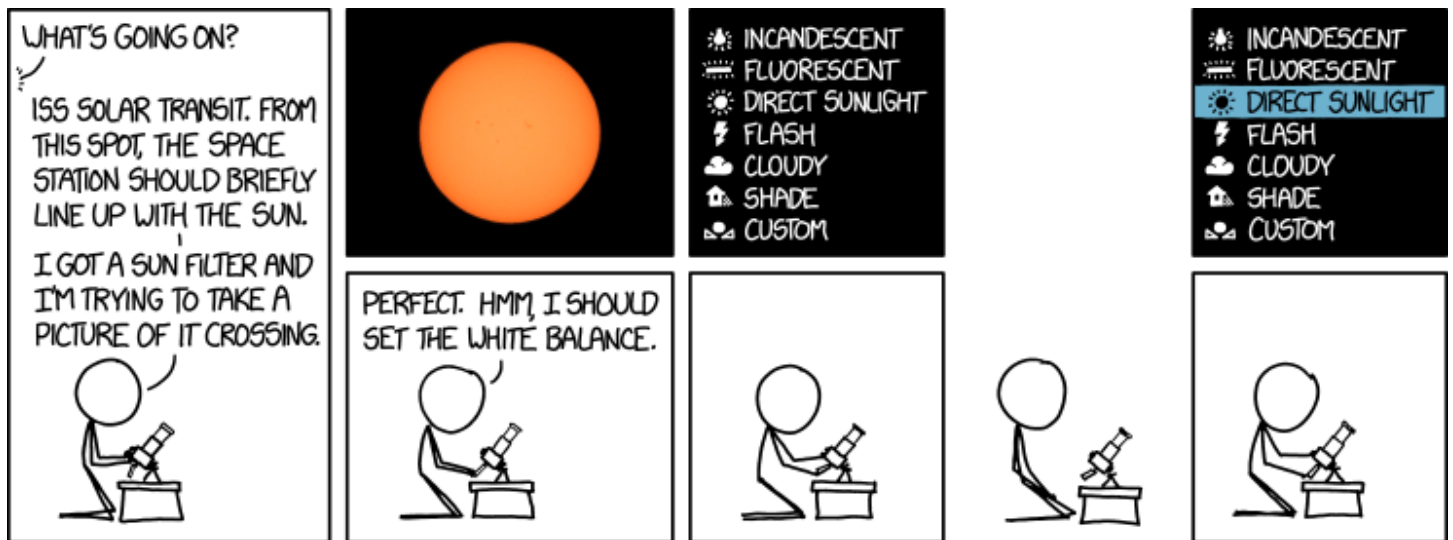
IC 4044 Discovered by Hermann Kobold on May 9, 1896

NGC 4907 Discovered by Heinrich d'Arrest on May 5, 1864. Most likely not a cluster member

IC 4045 Discovered by Guillaume Bigourdan on April 12, 1891

IC 4051 Discovered by Guillaume Bigourdan on April 12, 1891

Considering the image covers only 0.2 square degrees, that's a lot of NGC and IC galaxies in a small area of the sky. I was surprised at how near white most of these galaxies are with my normal color saturation. I was tempted to push it but decided against it.



NASA's Juno Spacecraft Completes Fifth Science Pass of Jupiter

Updated May 19, 2017, at 1:30 p.m. PDT

NASA's Juno mission accomplished a close flyby of Jupiter on May 19, successfully completing its fifth science orbit.

All of Juno's science instruments and the spacecraft's JunoCam were operating during the flyby, collecting data that is now being returned to Earth. Juno's next close flyby of Jupiter will occur on July 11, 2017, taking it over Jupiter's Great Red Spot.

May 18, 2017

Juno Scientists Prepare for Fifth Science Pass of Jupiter

NASA's Juno spacecraft will make its fifth science flyby over Jupiter's mysterious cloud tops on Thursday, May 18, at 11 p.m. PDT (Friday, May 19, 2 a.m. EDT and 6:00 UTC). At the time of perijove (defined as the point in Juno's orbit when it is closest to the planet's center), the spacecraft will have logged 63.5 million miles (102 million kilometers) in Jupiter's orbit and will be about 2,200 miles (3,500 kilometers) above the planet's cloud tops.

Juno launched on Aug. 5, 2011, from Cape Canaveral, Florida, and arrived in orbit around Jupiter on July 4, 2016. During its mission of exploration, Juno soars low over the planet's cloud tops -- as close as about 2,100 miles (3,400 kilometers). During these flybys, Juno is probing beneath the obscuring cloud cover of Jupiter and studying its auroras to learn more about the planet's origins, structure, atmosphere and magnetosphere.

NASA's Jet Propulsion Laboratory, Pasadena, California, manages the Juno



This enhanced color view of Jupiter's cloud tops was processed by citizen scientist Bjorn Jonsson using data from the JunoCam instrument on NASA's Juno spacecraft. Credits: NASA/JPL-Caltech/SwRI/MSSS/Bjorn Jonsson

mission for the principal investigator, Scott Bolton, of Southwest Research Institute in San Antonio. The Juno mission is part of the New Frontiers Program managed by NASA's Marshall Space Flight Center in Huntsville, Alabama, for the Science Mission Directorate. Lockheed Martin Space Systems, Denver, built the

spacecraft. JPL is a division of Caltech in Pasadena, California.

More information on the Juno mission is available at:

<https://www.nasa.gov/juno>

<http://missionjuno.org>

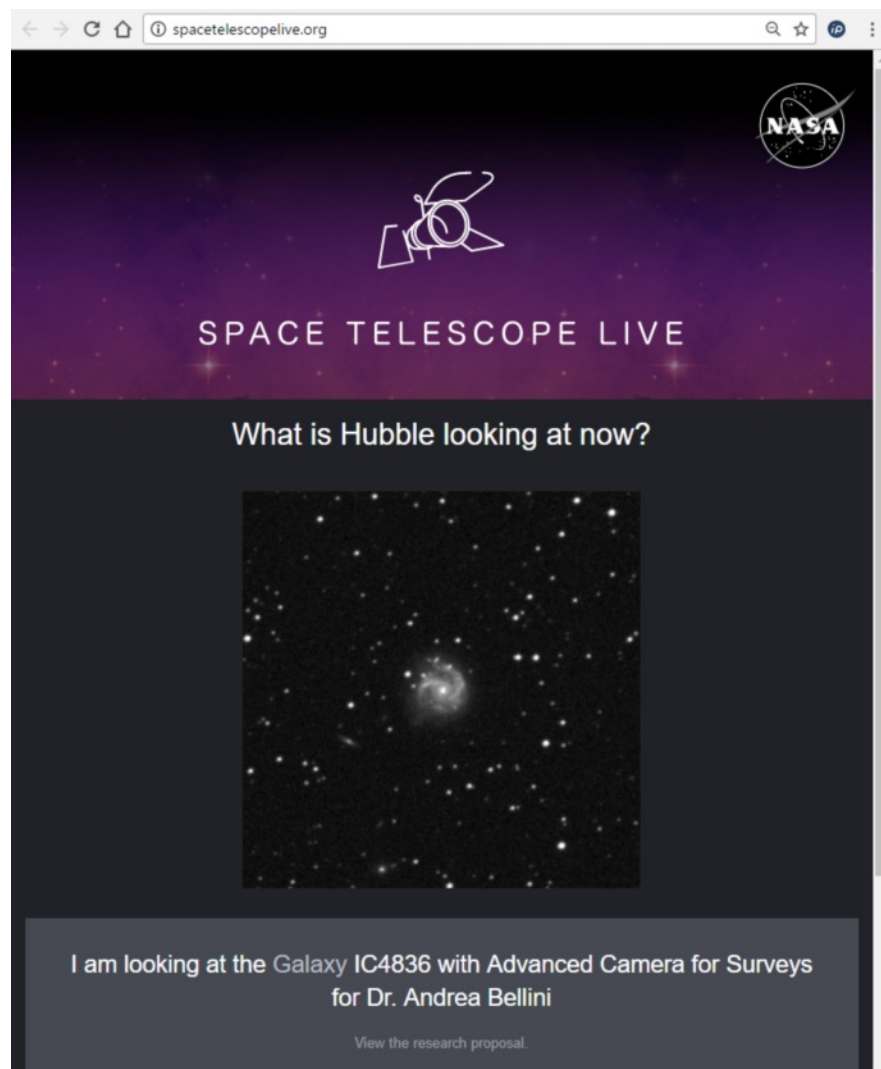
The public can follow the mission on Facebook and Twitter at:

<http://www.facebook.com/NASAJuno>

<http://www.twitter.com/NASAJuno>

What is Hubble Looking at Now?

Rick Johnson found this website. It is just a single web page that shows a graphic or DSS image of the object currently being imaged by Hubble and also who it is for. There is also a link to the pre-print concerning the need for the observation.



24th Nebraska Star Party - July 23-28, 2017



Mark Dahmke

Photo Credit: Fred Hultstrand History in Pictures Collection, NDIRS-NDSU, Fargo.

The early registration deadline is July 1st!

Join us this summer as we gather families from all over the US and around the world in the sparsely populated sand hills of North Central Nebraska to spend a good week under a galaxy of stars.

NSP Schedule of Events

Sunday: registration and check-in, optional dinner.

Monday: registration and check-in, field school, optional dinner.

Tuesday: registration and check-in, swap meet, field school, free "Cattle Country" hamburger dinner.

Wednesday: (All at Valentine High School) field school, registration, swap meet, speaker program, children's program, dinner on your own.

Thursday: Brewer's Niobrara Canoe or tube float, optional dinner.

Friday: public star party at 9pm.

For more information see the [NSP website](#).

Register online!

June Observing: What to View

Jim Kvasnicka

This is a partial list of objects visible for the upcoming month.

Planets

Mars: This is the last month Mars will be visible before it's lost in the Sun's glare.

Jupiter: Decreases in brightness to a magnitude -2.0 with a disk 37" across.

Saturn: Reaches opposition on June 14th. Saturn is at its closest to us for the year.

Neptune: In Aquarius.

Venus: Very bright in the east before sunrise.

Uranus: Very dim and difficult to see in the east before sunrise.

Mercury/Mars: Not visible in June.

Messier List

M58: Galaxy in Virgo.

M59/M60: Galaxy pair in Virgo that fit in the same FOV.

M84/M86: Galaxy pair in Virgo that fit in the same FOV.

M87: Galaxy in Virgo.

M88: Galaxy in Coma Berenices.

M89/M90: Galaxy pair in Virgo that fit in the same FOV.

M91: Galaxy in Coma Berenices.

M98: Galaxy in Coma Berenices.

M99: Galaxy in Coma Berenices.

M100: Galaxy in Coma Berenices.

Last Month: M49, M51, M61, M63, M64, M85, M94, M101, M102, M104

Next Month: M3, M4, M5, M53, M68, M80, M83

NGC and other Deep Sky Objects

NGC 4274: Oval shaped galaxy in Coma Berenices.

NGC 4559: Elongated galaxy in Coma Berenices.

NGC 4631: The Needle Galaxy in Coma Berenices.

Double Star Program List

Sigma Corona Borealis: Equal pair of bright yellow stars.

16/17 Draconis: Equal white stars.

Mu Draconis: Close pair of white stars.

Kappa Herculis: Yellow stars.

Alpha Herculis: Orange and greenish stars.

Delta Herculis: White primary with a blue-purple secondary.

Rho Herculis: Close pair of white stars.

95 Herculis: Yellow and white pair.

Alpha Librae: Wide pair of yellow and white stars.



Challenge Object

NGC 4459-4474 Area: Three galaxies in Coma Berenices that fit in the same FOV, NGC 4459, NGC 4468, and NGC 4474.

The Great American Total Eclipse August 21, 2017



Planning your eclipse trip? Take a look at Fred Espenak's presentation on YouTube:

<https://www.youtube.com/watch?v=K4KnxE6yAul>

Focus on Constellations: Coma Berenices _____

Jim Kvasnicka

Coma Berenices

Coma Berenices, Berenice's Hair, covers 386 square degrees in the sky. Coma is exceptionally rich in galaxies even for an off Milky Way constellation. The reason for so many galaxies is that toward Southwest Coma is the dense Coma-Virgo Galaxy Cluster. Many of the galaxies are excellent to observe even in modest size telescopes. Coma contains eight Messier objects, seven galaxies and one globular cluster.

Showpiece Objects

Galaxies: M64, M85, M88, M91, M98, M99, M100, NGC 4274, NGC 4559, NGC 4565, NGC 4725

Globular Clusters: M53, NGC 5053

Multiple Stars: 24 Comae Berenices, 35 Comae Berenices, β 800

Mythology

Coma Berenices represents the hair of Queen Berenices of Egypt, who cut off her flowing locks and placed them in a shrine as an offering to the gods for the safe return of her husband, Ptolemy II from battle. When the hair disappeared the royal astronomer saved the priests from execution by claiming the offering was met with such favor the gods placed the hair in the sky for all to see.

Number of Objects Magnitude 12.0 and Brighter

Galaxies: 50

Globular Clusters: 4

Open Clusters: 0

Planetary Nebulae: 0

Dark Nebulae: 0

Bright Nebulae: 0

SNREM: 0

Photo: Till Credner - Own work: AlltheSky.com



The Fizzy Seas of Titan

This article is provided by NASA Space Place.

With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology. Visit spaceplace.nasa.gov to explore space and Earth science!

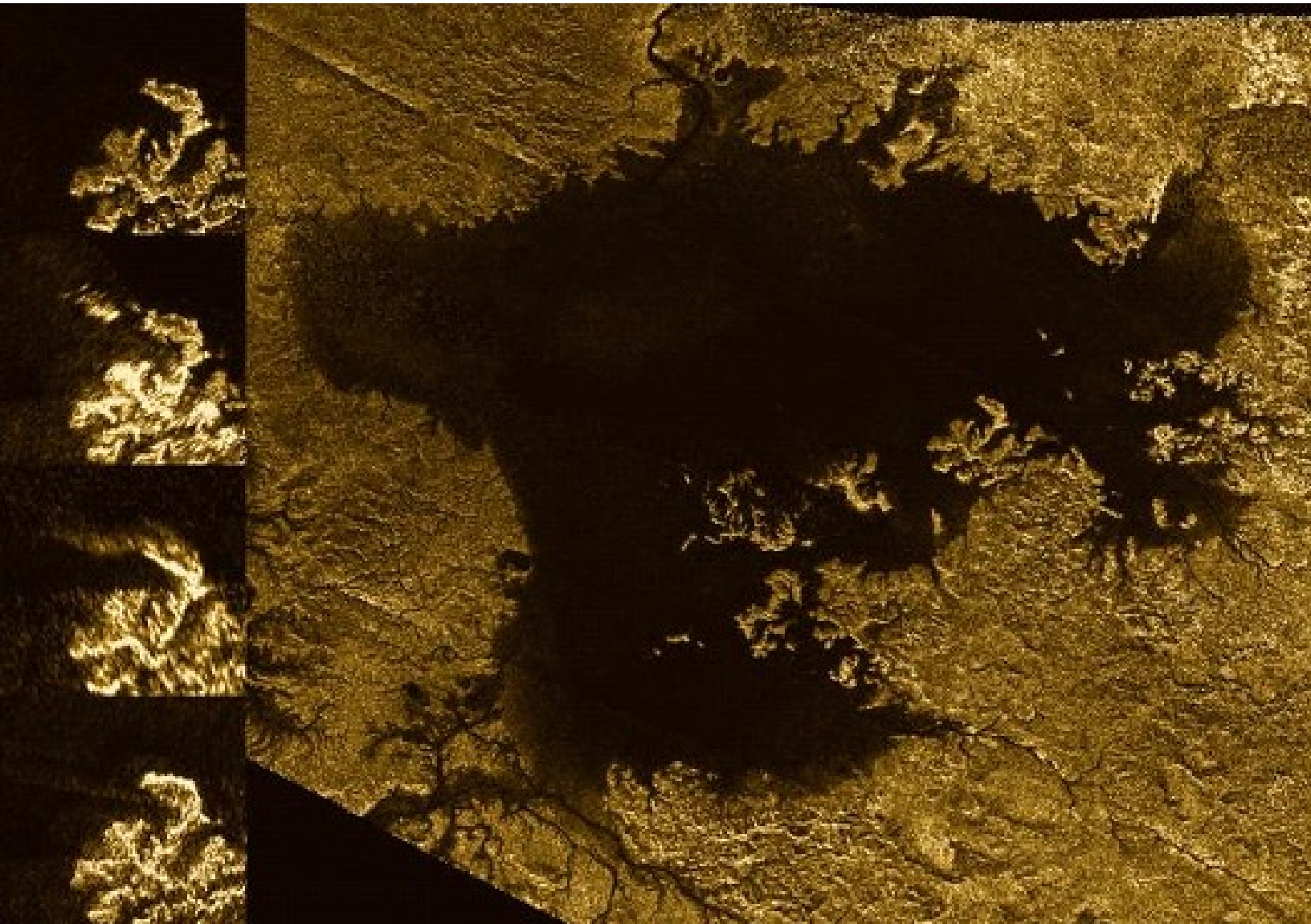
Marcus Wu



With clouds, rain, seas, lakes and a nitrogen-filled atmosphere, Saturn's moon Titan appears to be one of the worlds most similar to Earth in the solar system. But it's still alien; its seas and lakes are full not of water but liquid methane and ethane.

At the temperatures and pressures found on Titan's surface, methane can evaporate and fall back down as rain, just like water on Earth. The methane rain flows into rivers and channels, filling lakes and seas.

Nitrogen makes up a larger portion of the atmosphere on Titan than on Earth. The gas also dissolves in methane, just like carbon dioxide in soda. And similar to when you shake an open soda bottle, disturbing a Titan lake can make the nitrogen bubble out.



Caption: Radar images from Cassini showed a strange island-like feature in one of Titan's hydrocarbon seas that appeared to change over time. One possible explanation for this "magic island" is bubbles. Image credits: NASA/JPL-Caltech/ASI/Cornell

But now it turns out the seas and lakes might be fizzier than previously thought. Researchers at NASA's Jet Propulsion Laboratory recently experimented with dissolved nitrogen in mixtures of liquid methane and ethane under a variety of temperatures and pressures that would exist on Titan. They measured how different conditions would trigger nitrogen bubbles. A fizzy lake, they found, would be a common sight.

On Titan, the liquid methane always contains dissolved nitrogen. So when it rains, a methane-nitrogen solution pours into the seas and lakes, either directly from rain or via stream runoff. But if the lake also contains some ethane—which doesn't dissolve nitrogen as well as methane does—mixing the liquids will force some of the nitrogen out of solution, and the lake will effervesce.

"It will be a big frothy mess," says Michael Malaska of JPL. "It's neat because it makes Earth look really boring by comparison."

Bubbles could also arise from a lake that contains more ethane than methane. The two will normally mix, but a less-dense layer of methane with dissolved nitrogen—from a gentle rain, for example—could settle on top of an ethane layer.

In this case, any disturbance—even a breeze—could mix the methane with dissolved nitrogen and the ethane below. The nitrogen would become less soluble and bubbles of gas would fizz out.

Heat, the researchers found, can also cause nitrogen to bubble out of solution while cold will coax more nitrogen to dissolve. As the seasons and climate change on Titan, the seas and lakes will inhale and exhale nitrogen.

But such warmth-induced bubbles could pose a challenge for future sea-faring spacecraft, which will have an energy source, and thus heat. "You may have this spacecraft sitting there, and it's just going to be fizzing the whole time," Malaska says. "That may actually be a problem for stability control or sampling."

Bubbles might also explain the so-called magic islands discovered by NASA's Cassini spacecraft in the last few years. Radar images revealed island-like features that appear and disappear over time. Scientists still aren't sure what the islands are, but nitrogen bubbles seem increasingly likely.

To know for sure, though, there will have to be a new mission. Cassini is entering its final phase, having finished its last flyby of Titan on April 21. Scientists are already sketching out potential spacecraft—maybe a buoy or even a submarine—to explore Titan's seas, bubbles and all.

To teach kids about the extreme conditions on Titan and other planets and moons, visit the NASA Space Place: <https://spaceplace.nasa.gov/planet-weather/>

From the Archives: February, 1979

Reprinted from: *The Prairie Astronomy Club: Fifty Years of Amateur Astronomy*

A Trip to Bowbells – The 1979 Total Solar Eclipse

Ron Veys

Professor Carroll Moore was a solar eclipse chaser. He liked nothing better than spending as much time as he could in the shadow of the moon, traveling around the world to be at just the right place at the right time. So when a total solar eclipse was predicted to occur over the north-western U.S. on February 26, 1979, Carroll started making his plans. The closest place to Lincoln that was directly in the path of totality was extreme north-western North Dakota, specifically a little town of 400 people known as Bowbells, ND. It didn't matter to Carroll that this place was on the barren, wind-swept plains of the Dakotas, 28 miles south of the Canadian border, and that it would be February—he would be there. And he decided to take a few friends with him. So he chartered a bus and started signing people up.

About 30 people were talked into accompanying Carroll, including a few of his astronomy students and PAC members Larry Stepp, Donn Baker, and myself. Larry's wife, Vicki, and my wife, Cindy, were unconvinced that this would be the adventure of a lifetime, so they stayed home. They had trouble understanding why we wanted to travel almost 1600 miles to stand out in a snowy field in freezing temperatures just to experience 2-1/2 minutes of darkness in the middle of the day.

So on the afternoon of February 25, we boarded the bus in Lincoln and headed north. By the time we reached the South Dakota border we were immersed in a genuine prairie blizzard, the wet snow driven sideways by howling winds, covering the bus and the roads with a coating of ice. And so we drove through the night, the driver stopping a number of times to chip the ice off the wheels which had become unbalanced due to the weight of the ice, the passengers wondering if we would actually get to our destination in time and trying to catch what sleep they could in the cold sliding bus. Finally, just before dawn the snow stopped and we started making better time.

Totality was predicted to occur around noon and we arrived at our observing site about 10:30 am. Carroll had made previous plans with the local authorities to have a section of paved road plowed and blocked off for our use, so there we set up our equipment with snow on the ground all around and a sky mostly covered with clouds. Larry had brought a homemade 4-inch refractor telescope, I brought a 3-inch Tasco refractor that I had won in a telescope design competition the year before, and Donn had built a tracking platform on which he had mounted two cameras and he wore a set of #14 dark welders goggles through which he could see nothing but the bright sun. They made him look like an invading alien (I think more people were

taking pictures of Donn than were photographing the partial phases). I had designed and built a flip-down solar filter for my scope which I could use to photograph the partial phases of the eclipse and then immediately remove once totality started. I also took a portable tape recorder to tape the sounds of the observers during the excitement to come, and a thermometer with which I would register air temperature as the sun disappeared behind the moon.

About an hour before totality started, the clouds suddenly started to dissipate and the sun, with just a small bite out of it, became visible and remained visible throughout the eclipse. We found out later from local residents how lucky we had been. By their account, they had not seen the sun for at least two weeks, and the temperature had not risen above single digits for at least twice that amount of time. When the eclipse started, I recorded a temperature of 28 degrees F.

Shooting pictures through my telescope, I snapped quite a few nice photos of the eclipse on Ektachrome slide film, including partial phases, the diamond ring effect, the corona of the sun, and bright red flares around the edges of the eclipsing moon. My temperature measurements showed a four degree temperature drop during the totality phase. We also observed the moon's shadow

approaching us across the snow covered field, what we thought were shadow bands rippling across the snow just before totality, and spotted some bright stars in the sky that became visible during totality.

The 2-1/2 minutes of totality went by way too fast. Before we knew it, Carroll was yelling for people to put their filters back on as the sun emerged from the other side of the moon. Still in a daze after what we had just experienced, we all started packing up our equipment and climbing back on the bus. Local residents told us that the ladies of the town had

prepared a welcomed hot meal for us at the town's civic center and the bus headed into town. Inside the civic center (we might call it the town gym), we moved down a buffet line where the Bowbells ladies served us meat-loaf, pork sandwiches, spaghetti, and dozens of side dishes and desserts. At the end of the line was a little lady who kindly asked us to pay \$2.00 each. Since many of us hadn't eaten since the day before, we figured this was the biggest bargain since the invention of the all-you-can-eat buffet.

Finally, we all piled back into the bus to start the 18-hour uneventful trip back to Lincoln, arriving home in the dark early morning. Carroll got everybody back together about three weeks later to share stories and to show off their best pictures. He gave everybody a black tee-shirt that was printed in white on the front with a picture of the eclipsed sun and the words "I Found Totality in Bowbells." I still have that shirt as a reminder of the "adventure of a lifetime" that I shared with a dear old friend. I'd do it again in a second.



Solar eclipse trip, February, 1979
Bowbells, North Dakota.



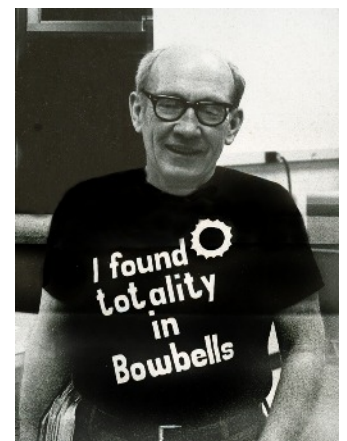
These photos were taken by Walter Erbach on the 1979 eclipse trip. Walter was a professor in the Engineering Mechanics Department at the University of Nebraska. This shows the group set up on a side road in Bowbells, North Dakota.



Donn Baker with of #14 dark welders goggles and a home-made tracking platform on which he had mounted two cameras.

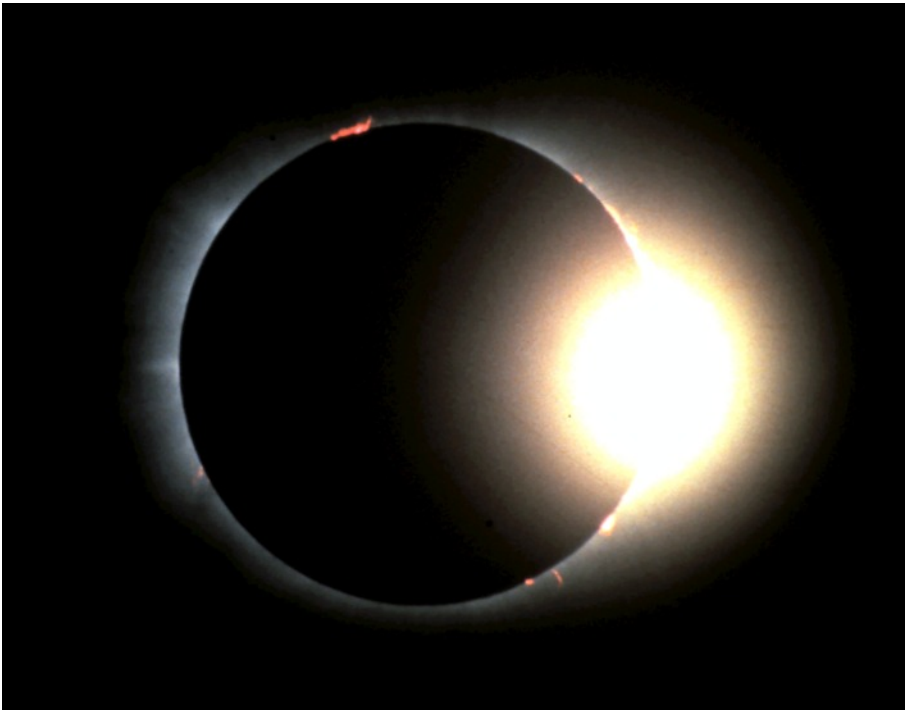
Above: in the left foreground is Don Baker, in the center is Ron Veys and on the far right is Larry Stepp.

Professor
Carroll
Moore





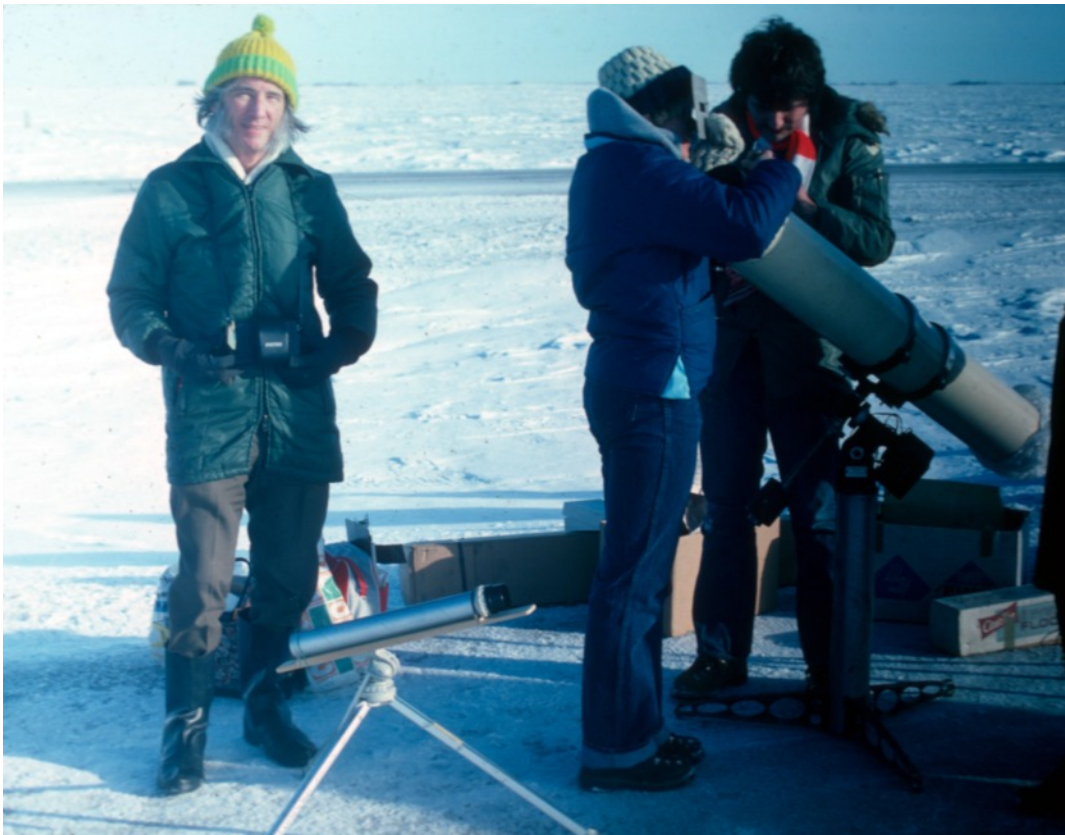
Larry Stepp with his home-made 4" f/15 telescope.



This photo of the eclipse was taken by Ron through his telescope.



These photos were taken by Larry Stepp on the February, 1979 solar eclipse trip to Bowbells, North Dakota. Below on the left is Professor Walter Erbach.



CLUB MEMBERSHIP INFO

REGULAR MEMBER - \$30.00 per year. Includes club newsletter, and 1 vote at club meetings, plus all other standard club privileges.

FAMILY MEMBER - \$35.00 per year. Same as regular member except gets 2 votes at club meetings.

STUDENT MEMBER - \$10.00 per year with volunteer requirement.

If you renew your membership prior to your annual renewal date, you will receive a 10% discount.

Club members are also eligible for special subscription discounts on Sky & Telescope Magazine.

CLUB TELESCOPES

To check out one of the club telescopes, please contact a club officer. Scopes can be checked out at a regular club meeting and kept for one month. Checkout can be extended for another month if there are no other requests for the telescope, but you must notify a club officer in advance.

100mm Orion refractor: David Pennington
10 inch Meade Dobsonian: Lee Taylor
13 inch Truss Dobsonian: Available

CLUB APPAREL



Order club apparel from cafepress.com:



Shop through Amazon Smile to automatically donate to PAC:



CLUB OFFICERS

President	Jim Kvasnicka (402) 423-7390 jim.kvasnicka@yahoo.com
Vice President	Brett Boller
2nd VP (Program Chair)	Mark Dahmke
Secretary	Lee Thomas lthomas@allophone.com
Treasurer	John Reinert jr6@aol.com
Club Observing Chair	Jim Kvasnicka jim.kvasnicka@yahoo.com
Outreach Coordinator	Mike Kearns mkearns@neb.rr.com
Website and Newsletter Editor	Mark Dahmke mark@dahmke.com

The Prairie Astronomer is published monthly by the Prairie Astronomy Club, Inc. Membership expiration date is listed on the mailing label. Membership dues are: **Regular \$30/yr, Family \$35/yr.** Address all new memberships and renewals to: **The Prairie Astronomy Club, Inc., PO Box 5585, Lincoln, NE 68505-0585.** For other club information, please contact one of the club officers listed to the right. Newsletter comments and articles should be submitted to: **Mark Dahmke, P. O. Box 5585, Lincoln, NE 68505** or mark@dahmke.com, no less than ten days prior to the club meeting. The Prairie Astronomy Club meets the last Tuesday of each month at Hyde Memorial Observatory in Lincoln, NE.